USS Arleigh Burke (DDG 51). The Navy plans to apply Hybrid Electric Drive to future DDG 51 Class Ships.

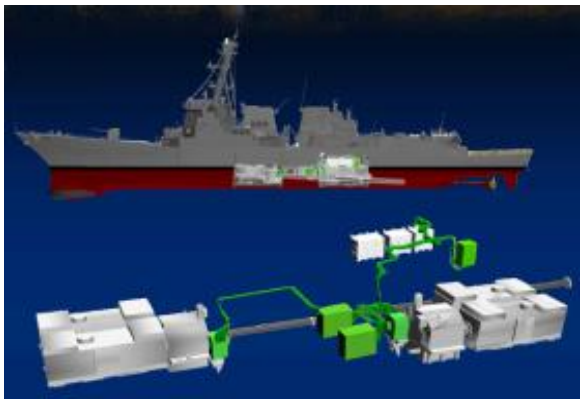
Hybrid Electric Drive

What is it?

Hybrid Electric Drive (HED) is a Propulsion Plant Modification that utilizes an electric motor attached to the Main Reduction Gear, allowing DDG 51 Class Ships to operate at higher efficiency.

Description

In electric propulsion mode, the main gas turbines are secured and gas turbine generators are electrically connected to a motor attached to each main reduction gear. The propulsion load is removed from the main gas turbines and placed onto the gas turbine generators. This mode allows the gas turbine generators to operate optimally, lowering fuel consumption.



In propulsion derived ship service mode the electric motors generate ship service power where the main gas turbines will be loaded to an optimal level reducing fuel consumption and securing a gas turbine generator to enable single generator operations.

Benefits

By utilizing Hybrid Electric Drive, the ship can optimally load the gas turbines to take advantage of their better fuel efficiency, as well as reduce their operating time. Through the integration of mechanical and electrical systems, the ship can operate at most speeds at a lower fuel consumption, providing fuel savings and longer time on station.

At a Glance

How Does it Work?

The use of an electric motor on each main reduction gear improves engineering plant efficiency by enabling the shut-down of propulsion gas turbines and/or gas turbine generators, thereby improving the specific fuel consumption of the on-line prime movers.

What Will it Accomplish?

Hybrid Electric Drive increases ship mission effectiveness by enabling longer time on station and has the potential to generate additional electric power for future sensors and weapons.

Metrics

- Potential fuel savings: 12%
- 8,000 bbls per ship, per year

For More Information

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